**TECHNOLOGY NEEDS/OPPORTUNITIES STATEMENT**

**REMOTE CUTTING TECHNOLOGIES FOR BUILDINGS 324 AND 327**

***Identification No.:*** RL-DD08
***Date:*** November 2001

***Program:*** 300 Area Facility Transition
***OPS Office/Site:*** Richland Operations Office/Hanford Site
***PBS No.:*** RL-RC06
***Waste Stream:*** Radioactively contaminated materials, equipment, tanks, pipes, gloveboxes, and ducting. Asbestos contaminated materials also require cutting.
***TSD Title:*** N/A
***Operable Unit (if applicable):*** N/A
***Waste Management Unit (if applicable):*** N/A
***Facility:*** Buildings 324 and 327

***Priority Rating:***

This entry addresses the "Accelerated Cleanup: Paths to Closure (ACPC)" Priority:

____ 1. Critical to the success of the ACPC.
_X_ 2. Provides substantial benefit to ACPC projects (e.g., moderate to high life-cycle cost savings or risk reduction, increased likelihood of compliance, increased assurance to avoid schedule delays).
____ 3. Provides opportunities for significant, but lower cost savings or risk reduction, and may reduce uncertainty in ACPC project success.

***Need Title:*** Remote Cutting Technologies for Buildings 324 and 327

***Need/Opportunity Category:*** *Technology Opportunity* -- The Site desires an alternative to the current baseline technology.

***Need Description:*** Low life-cycle cost cutting technologies are needed immediately for size reduction of radioactively contaminated materials, equipment, tanks, racks, pipes, etc. Many situations will require remote cutting capabilities using master-slave manipulators (MSMs), robotics arms or overhead cranes for deployment.

***Schedule Requirements:***

Earliest Date Required: (01/01/02)
Latest Date Required: (09/30/07)

***Problem Description:*** Deactivation requires removal and size reduction of a variety of equipment and materials. Radiation concerns often prevent direct access. Current methods are time consuming, generate secondary waste, cause a high degree of worker fatigue, and are costly.

***Potential Life-Cycle Cost Savings of Need (in $000s) and Cost Savings Explanation:*** A LCCS of $4.3M was estimated in a recently published ASTD proposal ("Laser Cutting System for Hot Cell Liner and Tank Size Reduction," dated March 2000). This estimate was based on specific tasks for removal of cell liners, high-and low-level vault piping, and tanks within the 324 Facility. The cost benefit analysis was based on a 50% reduction in time required to accomplish cell liner removal, and a 20% rate increase for all other cutting tasks in the 324 Facility. Additional savings may be realized from application in the 327 Facility as well as from size reduction of gloveboxes in Hanford's 308 Building.

***Benefit to the Project Baseline of Filling Need:*** Primary benefits to the project include increased task efficiencies and associated schedule reduction, improved ability to segregate waste via selective removal of "hot-spot" material sections, and personal dose reduction due to cutting speed improvements and remote application.

***Relevant PBS Milestones:***

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|---|---|---|
| TRP-06-921 | 324 Deactivation Complete | September 22, 2006 |
| TRP-07-930 | 327 Deactivation Complete | September 7, 2007 |

***Functional Performance Requirements:*** The equipment should be easily set up, be reliable, have capability for remote operations, and have little or low generation of dust or other secondary waste. The methods should operate faster than the currently used methods. Technology may be deployed by crane in locations having high radiation fields (2,000 to 5,000 R/hr). Most of the contaminated equipment is in hot cell locations where only cranes and/or manipulators are available for operations. Equipment requiring cutting in the hot cell environments include items with complex geometries, such as equipment racks, fuel racks, pipes, tanks, and hot cell liners.

***Work Breakdown Structure (WBS) No.:*** 1.04.10, 324/327 Buildings Stabilization/Deactivation

***TIP No.: N/A***

***Justification for Need:***

***Technical:*** Current methods are often too slow and labor intensive. High radiation levels prevent direct worker access equipment or materials requiring size reduction.

***Regulatory:*** Tri-Party Agreement Milestone M-89-00: Complete Closure of the Non-permitted MW Units of the 324 REC, HLV and LLV by October 2005. The

327 Building contains no TSD units; only the generating facility requirements of RCRA apply.
***Environmental Safety and Health:*** Occupational concerns in dealing with hot cells and materials with high levels of radioactive contamination.

***Cultural/Stakeholder Concerns:*** Stakeholders have expressed concerns with regard to the amount of waste destined for burial at the Hanford Site and about the ultimate disposition of large processing facilities and reactors. Effective size reduction efforts can minimize waste volumes and help facilitate decontamination efforts. Size reduction of waste helps facilitate the removal of radioactively contaminated materials and equipment.

***Other:*** None identified.

***Current Baseline Technology:*** Metal - plasma torch, hydraulic shears, hacksaws, oxygen-acetylene torch, diamond saws, circular saws; glove boxes - nibblers and shears.

***End User:*** EM-40.

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